

Work Order ID 67419

Page 1

Monday, March 21, 2011 7:11:13 AM

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 3/21/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/31/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date: 11-03-21

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D2580-041	Rev.D DEO-D1								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG003

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend I

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends and remove bending marks

2- Prepare tube for swaging as per QSI 002

1 11/03/22

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

DD

11-3-22

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

140

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R□□□ Aluminum Rod

ml16577 BE11/03/22
BE11/03/22

2-Grind welds on step as per Dwg D2580

3-Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2 x 17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Debur

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

BE11/03/22

150

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Quality Control

Memo

0.00

8 u103/22

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--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

160

QC5- Inspect part completeness to step on W/O

0.00

S w/03/22



QC

Memo

0.00

Quality Control

(X)

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

(X)

M-L 11/03/22

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

0.00

Powder Coating

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

10:40
330°
11:10

1 11-3-23

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

(IX) M-L 11/03/23

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Stop



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Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00



HandFinish

Hand Finishing

Memo

0.00

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ ☐ ☐ ☐ M116040

Sikaflex expire date: 11/02

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ ☐ ☐ ☐ M116040

Sikaflex expire date: 11/04

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: M116402

m. 11/03/23

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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Sub 6/3/23

Memo

0.00

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

②

220



Packaging

Packaging

Packaging

0.00

65974

Memo

0.00

Identify and pack for shipping as per PPPD205-634-041

Location: _____

PPP Rev: _____

11/3/23

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

11/3/23

11-03-29

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID: 67419

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube



Start Date: 3/21/2011

Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30
 KJ IPP Rev P 10.02.19
 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM IPP Rev:Q
 10.12.01 as per chg003 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D4202-1 Spacer		Manufactured	No			140	Each	502.0000	20	20		BE 11/03/22 B67308 (20)	
				<u>Location</u>				<u>Loc Qty</u>				<u>Loc Code</u>	
				LG002				502					
				65529				13					
				66121				1					
				66929				110					
				67129				201					
				67308				177					
D2580-1 205 Skidtube bent detail		Manufactured	No			110	Each	6.0000	1	1		BE 11/03/21 B67074 (91)	
				<u>Location</u>				<u>Loc Qty</u>				<u>Loc Code</u>	
				LG				6					
				59856				1					
				66727				1					
				67075				2					
				67076				2					
D2576-3 Step (maching detail)		Manufactured	No			140	Each	29.0000	1	1		BE 11/03/22	
				<u>Location</u>				<u>Loc Qty</u>				<u>Loc Code</u>	
				LG				29					
				52215				29					

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 2

Work Order ID: 67419

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 3/21/2011

Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

D2855

Manufactured No

200

Each

77.0000

1

1



Cap



m-l 4/03/23

Location

Loc Qty

Loc Code

FP005

1

56613

1

fp7

6

65519

6

ST024

70

50513

1

50770

28

51539

2

53791

4

65569

35

1X

AN3-5A

Purchased

No

200

Each

679.0000

2

2



Bolt



m-l 11/03/23

Location

Loc Qty

Loc Code

ST350

679

115016

13

115371

500

116632

166

2X

AN960JD10L

NAS1149D0332J

Purchased

No

200

Each

4.0000

2

2



Washer



m-l 11/03/23

Location

Loc Qty

Loc Code

ST335

4

11912

4

M 117010

2X

Monday, March 21, 2011 7:11:20 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
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Parent Item Name: Replacement Skidtube

Start Date: 3/21/2011

Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

ALS7-1032-130 Purchased

No

200

Each

1,478.000

50

50



Insert



m-l 11/03/23

Location

Loc Qty

Loc Code

FP	21	
115079	21	
ST282	1457	
113238	17	
115502	440	
116800 ✓	1000	

AN3C4A Purchased

No

200

Each

2,667.000

50

50



BOLT



50X XL
m-l 11/03/23

Location

Loc Qty

Loc Code

ST350	2667	
115300	25	
116075	337	
116924 ✓	1200	
117010	105	
117094	1000	

AN960C10L NAS1149C0332 Purchased

No

200

Each

-19.0000

50

50



washer



m-l 11/03/23

Location

Loc Qty

Loc Code

ST297	-19	
107534	-21	
108246	2	

M 116 304

50X

W/O:		WORK ORDER CHANGES					
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Start Date: 3/21/2011



Required Date: 3/31/2011

Start Qty: 1.00



Required Qty: 1.00

D3566-13 Manufactured No 200 Each 48.0000 1 1

 Gasket  m-l 11/03/23



Location	Loc Qty	Loc Code
FP014	48	
66137 ✓	12	
66550	36	

D3566-5 Manufactured No 200 Each 26.0000 1 1

 Gasket  m-l 11/03/23

Location	Loc Qty	Loc Code
FP015	26	
63574	1	
65528	4	
66146	1	
66552 ✓	20	

D3566-1 Manufactured No 200 Each 22.0000 2 2

 Gasket  m-l 11/03/23

Location	Loc Qty	Loc Code
FP015	22	
57715	1	
66129	1	
66548 ✓	20	

D3564-11 Manufactured No 200 Each 20.0000 1 1

 Wearshoe  m-l 11/03/23

Location	Loc Qty	Loc Code
FP019	20	
65159 ✓	1	
66154 ✓	14	
66554	5	

Monday, March 21, 2011 7:11:20 AM

Shop Packet Print

Page 4

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Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-13

Manufactured No

200

Each

57.0000

1

1



Wearshoe



m. 11/03/23

Location

Loc Qty

Loc Code

FP016

34

66549

12

66805

22

FP17

23

59660

1

66136 ✓

22

200

Each

18.0000

1

1

D3564-9

Manufactured No



Wearshoe



m. 11/03/23

Location

Loc Qty

Loc Code

FP019

17

55334

1

65524 ✓

8

66153

8

FP19

1

62238

1

IX

W/O:		WORK ORDER CHANGES					
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Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-5

Manufactured No

200

Each

30.0000

1

1



Wearshoe



m-l 11/03/23

Location

Loc Qty

Loc Code

FG

1

34806

1

FP019

24

57525

1

58709

1

66551 ✓

22

FP-19

5

63575

1

66148

4

IX

D2594-3

Manufactured No

200

Each

759.0000

16

16



O-Ring, 205 Skidtube



m-l 11/03/23

Location

Loc Qty

Loc Code

FP004

543

55546

19

58191

12

59358

12

65518

500

fpa

216

61762 ✓

216

16X

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Required Date: 3/31/2011

Start Qty: 1.00

Required Qty: 1.00

D2594-1

Manufactured No

200

Each

779.0000

16

16



Plug, 205 Skidtube



m-l 11/03/23

Location

Loc Qty

Loc Code

FP-A

779

42807

80

55002

71

58434

15

65980

33

66122 ✓

300

66932

241

67088

39

16x

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DART**RELEASED**
07.06.28**DEO ATTACHED**

DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

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ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 67419

PL11-0321

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

RELEASED
67-66-28

DEO ATTACHED

Technical drawing of a circular component with the following annotations and dimensions:

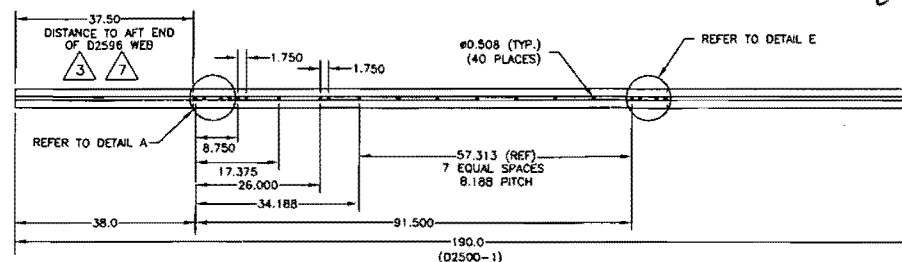
- Annotations:**
 - DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)
 - AN3-5A BOLT (1)
 - AN989JD10L WASHER (1)
 - (2 PLACES)
 - D2855 CAP
 - SEAL WITH SIKAFLEX-241/-291
 - SEE NOTE #1
- Dimensions:**
 - Ø0.208
 - 0.40

Diagram of a circular assembly with labels: D2579 SPACER, D2596 WEB (REF), and AL57-1032-130 (REF) (TYP 50 PLACES). A note indicates: AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY: 1. CHAMFER HOLE 0.050 X 45° 2. INSERT D2579 SPACER (20 PLACES) 3. WELD INTO PLACE AND GRIND FLUSH 4. C BORE D2579 SPACER TO #0.437 X 1.00 DEEP.

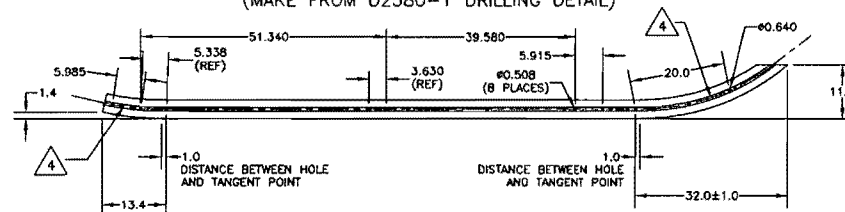
D2580-045 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE
WITH THE SPACER AT THIS LOCATION

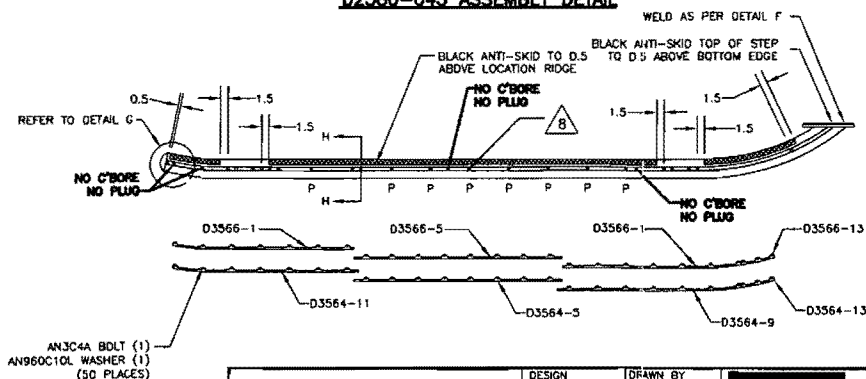
D2580-1 DRILLING DETAIL



D2580-5 BENDING AND CUTTING DETAIL
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



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DESIGN	<i>PH</i>
CHECKED	<i>HA</i>
DATE	07.02.27

DRAWN BY	<i>RH</i>
APPROVED	<i>H</i>

DART

DART AEROSPACE LTD.
HARTSEBURY, ONTARIO, CANADA

DRAWING NO.	D2580
TITLE	205 SKI

REV. 0
SHEET 3 OF 3
SCALE
1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D2580	TITLE 205 SKIDTUBE ASSEMBLY	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D2580-D-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>L</i>	MFG. APPR. <i>R</i>	APPROVED <i>MP</i>		DE APPR. <i>H</i>		
DATE 10.09.22	DATE 10.11.04	DATE 10.11.04	DATE 10/11/04		DATE 10.11.04		

PURPOSE:

CHANGE ALL WELDED CROSSBOLT SPACERS TO SWAGED SPACERS

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

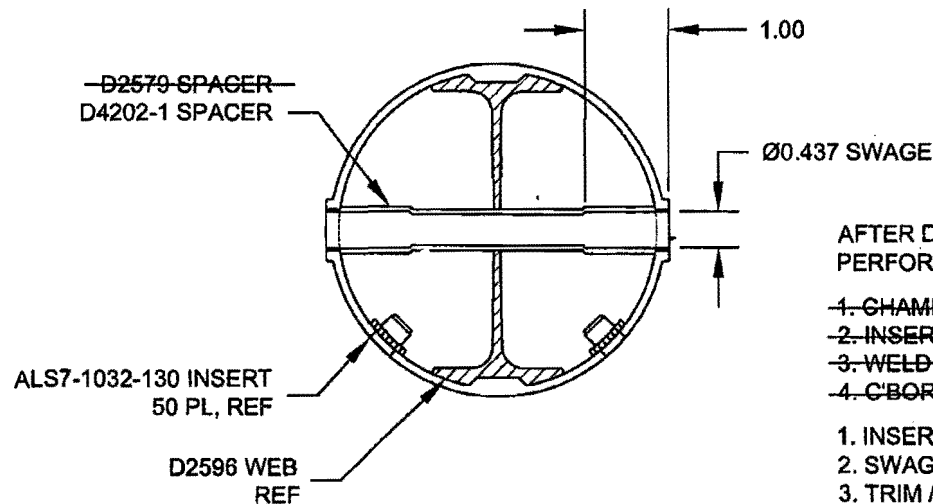
WAS

QTY -041	QTY -045	PART NUMBER	DESCRIPTION
20	24	D2579	CROSS BOLT SPACER

IS

QTY 20	QTY 24	PART NUMBER	DESCRIPTION
		D4202-1	SPACER

SECTION D-D & SECTION H-H ARE AMENDED AS FOLLOWS:



SECTION D-D
NOT TO SCALE

SECTION H-H
NOT TO SCALE

RELEASED
2010-11-18
MP

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

1. INSERT D4202-1 SPACER, 20 PL (-041) OR 24 PL (-045)
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
3. TRIM / GRIND FLUSH PER QSI 002

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries